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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,697	09/16/2003	Cheng Li	4003.13	5503

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EXAMINER	
GUPTA, ANISH	

ART UNIT	PAPER NUMBER
1654	

DATE MAILED: 07/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/664,697	LI ET AL.	
	Examiner	Art Unit	
	Anish Gupta	1654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8-16-04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of the species (NH2-Gly-Thr-Pro-Gly-Pro-Gln-Gly-Ile-Ala-Gly-Gln-Arg-Gly-Val-Val)4-(Lys)2-(Lys)-β-Ala-COOH in the reply filed on 5-15-06 is acknowledged.

In the restriction requirement, Applicants were advised with emphasis "Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103(a) of the other invention."

In their response, Applicants stated "[t]he generic compounds defined by Claims 1 and 2 is a single claimed invention under 35 § U.S.C. 121. The further elements added in claim 2 and dependent Claims 3 to 29 further define the invention set forth in Claims 1 and 2. **It is respectfully submitted that these claims, and the Groups of compounds set forth therein, do not define independent inventions. The specific compounds set forth in claims 2 to 29 act by the same mode of operation and are each capable of use for the same function. These specific compounds act as compositions of matter for the active structure MAP-S. The function of the MAP-S compounds is to act as anti-inflammatory agents, growth factor agents, adhesion barrier agents, anti-thrombogenic agents, growth factor agents, adhesion barrier agents or combinations thereof.**" (see page 15 of the response dated May 15 2006).

Thus, Applicants have admitted on the record that the species "do not define independent inventions" since they "act by the same mode of operation and are capable of use for the same

function." Accordingly, this admission has been used in the rejection under 35 U.S.C. 103(a) of the other invention. In view of Applicants admission, the election of species is also hereby withdrawn.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-4, 6-13, 17 and 20-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The MPEP states that the purpose of the written description requirement is to ensure that the inventor had possession, as of the filing date of the application, of the specific subject matter later claimed by him. The courts have stated:

> "To fulfill the written description requirement, a patent specification must describe an invention and do so in sufficient detail that one skilled in the art can clearly conclude that "the inventor invented the claimed invention." Lockwood v. American Airlines, Inc., 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (1997); In re Gosteli, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989) (" [T]he description must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed."). Thus, an applicant complies with the written description requirement "by describing the invention, with all its claimed limitations, not that which makes it obvious," and by using "such descriptive means as words, structures, figures, diagrams, formulas, etc., that set forth the claimed invention." Lockwood, 107 F.3d at 1572, 41 USPQ2d at 1966." Regents of the University of California v. Eli Lilly & Co., 43 USPQ2d 1398.

The MPEP lists factors that can be used to determine if sufficient evidence of possession has been furnished in the disclosure of the Application. These include "level of skill and knowledge in the art, partial structure, physical and/or chemical properties, functional characteristics alone or coupled with a known or disclosed correlation between structure and function, and the method of making the claimed invention. Disclosure of any combination of such identifying characteristics that distinguish the claimed invention from other materials and would lead one of skill in the art to the conclusion that the applicant was in possession of the claimed species is sufficient." MPEP 2163.

Further, for a broad generic claim, the specification must provide adequate written description to identify the genus of the claim. In Regents of the University of California v. Eli Lilly & Co., the court stated:

> "A written description of an invention involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as by structure, formula, [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials. Fiers, 984 F.2d at 1171, 25 USPQ2d at 1606; In re Smythe, 480 F.2d 1376, 1383, 178 USPQ 279, 284-85 (CCPA 1973) ("In other cases, particularly but not necessarily, chemical cases, where there is unpredictability in performance of certain species or subcombinations other than those specifically enumerated, one skilled in the art may be found not to have been placed in possession of a genus. . . ."). Regents of the University of California v. Eli Lilly & Co., 43 USPQ2d 1398.

The MPEP further states that if a biomolecule is described only by a functional characteristic, without any disclosed correlation between function and structure of the sequence, it is "not sufficient characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence." MPEP 2163. The MPEP does state that for generic claim the genus can be adequately described if the disclosure presents a sufficient number of representative species that encompass the genus. MPEP 2163. If the genus has a substantial variance, the disclosure must describe a sufficient variety of species to reflect the variation within that genus. See MPEP 2163. Although the MPEP does not define what constitute a sufficient number of representative, the Courts have indicated what do not constitute a representative number species to

adequately describe a broad generic. In Gostelli, the Court determined that the disclosure of two chemical compounds within a subgenus did not describe that subgenus. In re Gostelli, 872 F.2d at 1012, 10 USPQ2d at 1618.

In the instant case, the claims are drawn to multiple antigen peptides (MAPS) bound to substrate. The claims state that the antigen peptide (R) is any length and contains any type and number of cell-binding ligands, any type and number of amino acids up to 1500 amino acids, anti-inflammatory structures anti-thrombogenic structures, growth factor structures, adhesion barrier structures and combinations thereof with the proviso that, the MAP has a active functional groups to covalently link the MAP structure to the surface of the substrate (S), located on group X, Z or R (see claim 1 and 2). The claims further states that the Z variable is up to 500 amino acids (see claims 1-2). The dependent claims limit the lengths of the amino acids to less then 50 amino acids but do not specifically define the peptide antigen (R). These generic statements for the R variable, that it is up to 1500 amino acids and Z is less than 500 amino acids, does not provide ample written description for the compounds since the claims do not describe a singe structural feature. Further, the statements regarding antinflammatory structures, anti-thrombogenic, growth factor, adhesion barrier structure, does not provide ample written description since this only defines the function of the molecule and not the structure. The specification does provide examples of what qualify as compounds of the claimed invention. However, these to a handful of peptides with amino acid sequences of up to 20 amino acids in length.

As stated earlier, the MPEP states that written description for a genus can be achieved by a representative number of species within a broad generic. It is unquestionable claim 1 is a broad generic with respect all possible compounds encompassed by the claims. The possible structural variations are limitless to any class of peptide that has up to 1500 amino acids. Solely using the R variable, the number of different compounds encompassed by the claims are 1500^{20}. This does not

take into account the branching or R and the length of Z. It must not be forgotten that the MPEP states that if a biomolecule is described only by a functional characteristic, without any disclosed correlation between function and structure of the sequence, it is "not sufficient characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence." MPEP 2163. Here, though the claims may recite some functional characteristics, the claims lack written description because there is no disclosure of a correlation between function and structure of the compounds beyond compounds disclosed in the examples in the specification. Moreover, the specification lack sufficient variety of species to reflect this variance in the genus since the specification does not provide any examples of derivatives. The specification is void of any peptides that have a length of greater than 20-25 amino acids in length. There is no disclosure any peptides of sequences containing 100 or thousands of amino acids as the claims recite. Further, this is also noticeable for the Z variable. The specification only defines the Z variable as a single amino acid. The specification does not provide any written description for a Z variable, where it is 2, 100 or even 500 amino acids in length. The description requirement of the patent statute requires a description of an invention, not an indication of a result that one might achieve if one made that invention. See In re Wilder, 736 F.2d 1516, 1521, 222 USPQ 369, 372-73 (Fed. Cir. 1984) (affirming rejection because the specification does "little more than outlin[e] goals appellants hope the claimed invention achieves and the problems the invention will hopefully ameliorate."). Accordingly, it is deemed that the specification fails to provide adequate written description for the genus of the claims and does not reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the entire scope of the claimed invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 2-19, 21-24, 28-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites that X can be linked amino acids 1-5 "X1, X2, X3, X4, X5." It is unclear if the X1, X2 variables define specific peptides of lengths between 1 and 5 amino acids or are individual amino acids. If they are amino acids, the it is unclear if they are conjugated to one another in any particular order.

Claims 19 lacks recites the limitation "X1-X2-" in base claim 2. There is insufficient antecedent basis for this limitation in the claim. The base claims states that the "Xs" linked 1 to 5 amino acids. However, the claims does not state that the X1, X2 etc.. are linked to one another.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and

invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nomizu et al. in view of .

The claims are drawn to multimeric peptide structure bound to a substrate.

The reference of Nomizu et al. teach multimeric form of the active laminin peptide YIGSR. The reference specifically teaches peptides having the sequence: (Ac-Tyr-Ile-Gly-Ser-Arg-Gly)4-Lys2-Lys-Gly-OH, (Ac-Tyr-Ile-Gly-Ser-Arg-Gly)8-Lys4-Lys2-Lys-Gly-OH, (Ac-Tyr-Ile-Gly-Ser-Arg-Gly)16-Lys8-Lys4-Lys2-Lys-Gly-OH (see page 250). The multimeric structure of the peptides meets the limitation of claim 2 of the instant application, where the R's correspond to the sequence Tyr-Ile-Gly-Ser-Arg-Gly, The Z's correspond to the lysines, and X corresponds to the Glycine residue. Further, the sequence Tyr-Ile-Gly-Ser-Arg-Gly corresponds to SEQ ID NO. 5 in claim 5 of the instant application. The difference between the prior art and the instant application is that the reference does not specifically disclose the conjugation of the multimeric structure to a substrate (S).

However, Nomizu et al. states Tam and his coworkers established the multimeric antigenic peptide (MAP) system in which the antigen peptide is assembled on a lysine tree (see page 249). Reference of Ruben et al. that multiple antigen peptides (MAPs) were first described by J. P. Tam. MAPs consist of multiple copies of a specific peptide attached to a non-immunogenic lysine core. MAP peptides usually contain four or eight copies of the peptide often referred to as MAP-4 or MAP-8 peptides. By way of non-limiting example, MAPs may be synthesized onto a lysine core matrix attached to a polyethylene glycol-polystyrene (PEG-PS) support (see page 66, paragraph 138). Note that polystyrene is one of the substrates claimed in claims 4, 6, 9 and 26. Therefore it would

have been obvious to one of ordinary skill in the art to synthesize the multimeric structure of Nomizu et al. and attain a product where the branched polypeptide is bound to the polystyrene. This (Ac-Tyr-Ile-Gly-Ser-Arg-Gly)$_x$-Lys$_n$-Lys$_n$-Lys-Gly polystyrene peptide meets the limitation of the claimed invention.

Furthermore, since Applicants have admitted on the record that the inventions of claims 1 and 2 do not define independent inventions. Because the specific compounds set forth in claims 2 to 29 act by the same mode of operation and are each capable of use for the same function, it is deemed that all of the compounds claimed are obvious variants of one another and are obvious under 103(a).

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anish Gupta whose telephone number is (571)272-0965. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang, can normally be reached on (571) 272-0562. The fax phone number of this group is (571)-273-8300.

7/24/08

Anish Gupta
Patent Examiner